

CLAIMS

1. A method for in situ sampling and monitoring of a fluid flowing in a flow path (3), whereby the fluid is to be directed to a chamber;
a first valve (7) provides a connection between an inlet (4) to the chamber
5 (6) and the flow path,
a second valve (8) provides a connection between an outlet (4) from the chamber and the flow path,
wherein the method comprises the following steps:
a) opening the first valve (7) and the second valve (8) to let the fluid flow
10 through the inlet (4) to the chamber (6) and from the chamber through the outlet (4) into the continuation of the fluid path (14), thereby allowing fluid to circulate through the chamber (6) for a certain time,
c h a r a c t e r i z e d b y
b) trapping the fluid in the chamber (6) by closing the second valve (8) and
15 thereafter closing the first valve (7),
c) opening a valve (9) or an access valve (11) for reducing pressure, to obtain a pressure in the chamber (6) suitable for monitoring the fluid,
d) and leading the fluid trapped in the chamber (6) into a monitor system (2) through the access valve (11) wherein the fluid is analyzed, and thereby
20 providing data representing the fluid characteristics,
e) providing exit for the fluid analyzed through a further fluid path (13) possibly to a low pressure section of the system.
2. A method according to claim 1,
c h a r a c t e r i z e d b y t h a t in step c) opening the valve (9) for the
25 chamber to communicate with an expansion chamber (10).
3. A method according to claim 2,
c h a r a c t e r i z e d b y opening a valve (12) for maintaining pressure in the chamber (6).
4. A method according to claim 1,
30 c h a r a c t e r i z e d b y performing step a) and loading a gas cavity (16), preferably via an internal check valve (17), allowing the pressure to build up in the gas cavity (16).
5. A method according to claim 4,
35 c h a r a c t e r i z e d b y utilising the gas contained in the gas cavity (16) to pressurize the fluid to force the fluid through the chamber (6) and through the monitor system (2).

6. A method according to one of the claims 1-3,
c h a r a c t e r i z e d b y leading the fluid into the monitor system by
the effect of an internal pump of the monitor system.
7. A method according to one of the proceeding claims,
5 c h a r a c t e r i z e d b y analyzing the fluid and the possible particles
therein by a monitor system (2) such as an optical system comprising a light
source, an optical detector and means for processing data.
8. A method according to one of the proceeding claims,
c h a r a c t e r i z e d b y storing the data from the analyzed fluid, and/or
10 transferring the data to a remote computer for evaluation or maintenance
support, wherein the data can be transferred automatically after each analysis
record, after an accumulation of a number of analyses record, or on a time
sequence or on demand by a local or remote operator.
9. An apparatus for in situ sampling and monitoring a fluid flowing in a flow
15 path comprising:
-an inlet (4) and an outlet (4) connected to a chamber (6),
-a first valve (7) provided for connecting the inlet (4) to the flow path (3),
-a second valve (8) provided for connecting the outlet (4) to the flow path
(3),
20 thereby allowing the fluid to fill the chamber (6), circulate the fluid through
the chamber (6) for a certain time, and capturing the fluid in the chamber (6),
c h a r a c t e r i z e d b y
- providing an access valve (11) for leading the fluid which is captured in the
chamber (6) into a monitor system (2) where the fluid is to be analyzed,
25 wherein
reduction of the pressure to in the chamber (6) suitable for the monitor
system (2) is taken care of by the access valve (11) or a valve (9).
10. An apparatus according to claim 9,
c h a r a c t e r i z e d b y
30 the provision of a valve (12) for relieving pressure.
11. An apparatus according to claim 9 or 10,
c h a r a c t e r i z e d b y the provision of an expansion chamber (10)
communicating with the chamber (6) through the valve (9) for reducing
pressure.
- 35 12. An apparatus according to claim 9,
c h a r a c t e r i z e d b y
the provision of a gas cavity (16), which preferably contains a separation
membrane between the liquid fluid and gas.

13. An apparatus according to claim 12,
c h a r a c t e r i z e d i n t h a t
the gas cavity (16) is provided with a check valve (17), which preferably is
operated by a solenoid (19).
- 5 14. An apparatus according to one of the claims 9-13,
c h a r a c t e r i z e d i n t h a t the monitor system (2) is an optical
system comprising a light source, an optical detector, means for processing
data.
- 10 15. An apparatus according to one of the claims 9-14,
c h a r a c t e r i z e d i n t h a t the monitor system is connected to a
computer, for transferring the data of the analyzed fluid, possibly to a remote
site for evaluation or maintenance support, wherein the data can be
transferred automatically after each analysis record, after an accumulation of
a number of analyses record, or on a time sequence or on demand by a local
15 or remote operator.